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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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05/18/2006

Holger Stark

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EXAMINER

BASKIN, JEREMY S

ART UNIT

PAPER NUMBER

3753

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/579,885	Applicant(s) STARK ET AL.	
	Examiner Jeremy S. Baskin	Art Unit 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16,18,19,21-28 and 31-39 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16,18,19,21-28,31-35 and 37-39 is/are rejected.
- 7) ☒ Claim(s) 36 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>06/17/2010, 07/14/2010</u> . | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02 June 2010 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 16, 18, 22, 31-34, and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinz (DE19731382) in view of Kirby (4,744,340). An automated translation of Heinz, titled DE19731382 Translation, is referred to below.

4. In regard to Claims 16, 18, 22, 33, and 34, Heinz teaches a lightweight combustion engine valve (Figure 7) for internal combustion engines possessing a metallic valve stem 82 (page 1, para. 1), a valve stem end face 91, a hollow valve cone 96, and a valve disk 90. The valve cone 96 has a region of greater diameter at 97. The valve cone and valve disk together form a hollow space 98 and the valve disk 90 is provided with a gripping receiver 95 and a flat top side at 90 for supporting the gripping receiver 95 and valve stem end face 91. The gripping receiver 95 grips an end portion of the valve stem 82 along 110. The valve disk 90 has a recess

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below 91 defined by an edge step 91 which forms an edge region for supporting the region of greater diameter of the valve cone 96 as a lap joint. This claim is identified as having product-by-process subject matter i.e. welding the valve cone to the valve disk and valve stem. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. See MPEP 2113 [R-1].

Heinz fails to specifically teach where the gripping receiver forms a plurality of reinforcing ribs on the valve disk with each having an upper face and narrow side for supporting the valve cone. Heinz fails to further teach where each of the reinforcing ribs includes an end face facing a center of the valve disk center so as to form separate wall portions for gripping an outer circumference of the valve stem.

Kirby discloses a valve head and stem. In Figure 2, Kirby teaches where a plurality of reinforcing ribs 14 are disposed on a valve disk 13 and extend radially outward from a valve stem 15 to a circumference at 16 of the valve disk 13. An end face 22 of each of the reinforcing ribs 14 faces the center of the valve disk 13 and forms separate walls of a gripping receiver for gripping an outer circumference of the valve stem 15. The reinforcing ribs 17 have a height at 20 that increases in a direction toward a center of the valve disk 15.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to replace the gripping receiver of Heinz with a gripping receiver comprising a plurality of radially extending reinforcing ribs on a valve disk, as taught by Cemenska, so as to prevent the

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valve stem from deflecting horizontally at the connection with the valve disk while also providing for a heat sink for the valve stem.

In regard to Claim 19, Heinz in view of Kirby fails to specifically teach where the plurality of reinforcing ribs is three reinforcing ribs arranged at a spacing of 120 degrees from another. However, Kirby teaches where any desired number, and therefore arrangement, of ribs can be applied (col. 4, lines 57-61). As such, it would have been obvious to one of ordinary skill in the art incorporate, in Heinz in view of Kirby, three reinforcing ribs at 120 degrees from one another, as a mere subtraction and rearrangement of parts.

5. In regard to Claims 31, 32, 37-39, when making and or using the lightweight combustion engine valve of Heinz, one necessarily performs the method of manufacturing a lightweight valve by producing a first component forming a valve disk 90 by forming (page. 5, para. 10), producing a second component forming a valve stem 82, and producing a third component by forming a valve cone 96. The valve disk 90 includes a flat upper side above 85 for supporting a gripping receiver 95. The valve disk 95 and valve stem 82 are connected by a forcing a valve stem end face 91 on a flat side of the valve disk 95 at 91. In doing so, the valve stem 82 is forced through the gripping receiver 95 to for a non-positive connection. The valve cone is pushed onto the valve stem and the valve cone is then connected to the valve stem and disk assembly by engaging a greater diameter end below 97 of the valve cone 96 in a recess defined by an edge step 97 which forms an edge region therein on the valve disk 95. Heinz fails to teach where the gripping receiver is formed with the valve disk as one piece a forms a plurality of reinforcing ribs with an end face forming a wall portion on the outer surface of the valve stem. Heinz fails to further teach where the valve cone is welded to the valve disk and valve stem.

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Kirby discloses a valve for internal combustion engines. Kirby teaches, in Figure 2, where a gripping receiver at 14 is formed as one piece with a valve disk 13 (col. 4, lines 67 and 68). The gripping receiver at 14 is formed of a plurality of reinforcing ribs 14 each with an end face 22 facing a center of the valve disk 13. Each end face 22 forms a separate wall portion which contacts the outer circumferential surface of the valve stem 15. Each of the reinforcing ribs 14 includes an upper face 18 facing away from a flat side at 13 of the valve disk 13.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to replace the gripping receiver of Heinz with a gripping receiver comprising a plurality of radially extending reinforcing ribs integrated with a valve disk, as taught by Kirby, so as to prevent the valve stem from deflecting horizontally at the connection with the valve disk while also providing for a heat sink for the valve stem. The combination of Heinz in view of Kirby necessarily teaches where the wall portions of the gripping receiver form a non-positive connection with the valve stem. In Figure 7, Heinz teaches where the valve cone 96 is permanently connected to the valve disk 95 and valve stem 82. The combination further teaches where the inner wall of the valve cone of Heinz is pushed into contact with the upper faces of the reinforcing ribs of Kirby. Because all of the components are metallic and that welded and metal cast connections are notoriously known, one of ordinary skill in the art would recognize that any or all connections between the components are suitable for welding or metal casting at any time during assembly so as to increase the bond strength of the connections.

6. Claims 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinz in view of Kirby as applied to Claims 16 and 22 above, taken with Topham et al. (5,044,604).

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In regard to Claims 21, 23, and 24, Heinz in view of Kirby fail to specifically teach where the reinforcing ribs are rectilinear strips which have a height that rises linearly from a radially external end towards the center of the disk formed and where a linearly rising first portion of the ribs is adjoined by a second reinforcing rib of constant height.

Topham discloses a valve stem and disk with a gripping receiver. In Figure 6, Topham teaches a gripping receiver is formed by a plurality of reinforcing ribs which form rectilinear strips 7 which have a height that rises linearly from a radially external end 13 towards a center of a disk 14 where a linearly rising first portion at 20 is adjoined by a second reinforcing rib of constant height at 7.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate, in Heinz in view of Kirby, reinforcing ribs with linear first and second portions, as taught by Topham, so as to increase the strength of the reinforcing ribs during a molding or casting process.

Claims 25, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinz in view of Kirby as applied to Claims 16 and 22 above, taken with Cummings (2,439,240).

In regard to Claims 25, 26, and 28, Heinz in view of Kirby fail to specifically teach where a linear first portion is adjoined by a linear second portion to complement an inner wall of the valve cone through a material connection and where a cutout is provided in a region of the gripping receiver.

Cummings discloses a valve for internal combustion engines. Cummings teaches where the reinforcing ribs 18a extend from a radially external end S to the direction of the center of the valve disk 18c so as to complement the inner wall 18a of the hollow valve cone. In effect, the

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reinforcing ribs are the summation of numerous linearly rising reinforcing ribs that are each adjoined tangential to the inner surface of the valve cone. The reinforcing ribs 23a and 28 are provided with a cutout 28a, 28b and S in the area of the gripping receiver 23b, respectively, so as to reduce the size of the reinforcing end faces (col. 5, lines 4- 13). The valve cone 10b and ribs 13 are cast and forged together (col. 1, lines 40-52).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate adjoined linearly rising reinforcing ribs with cutouts that complement an inner surface of valve cone, as taught by Cummings, so as to sufficiently support and connect a valve cone and valve disk and to allow coolant to fully occupy the created hollow space. It further would have been obvious to one of ordinary skill in the art to connect a valve cone and reinforcing ribs together within an internal combustion valve, as taught by Cummings, so as to create a permanent heat conducting path between the two components.

Claims 27 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinz in view of Kirby taken with Cummings, as applied to Claim 25, taken with Blanchet (2,111,549).

In regard to Claims 27 and 35, Heinz in view of Kirby fail to specifically teach where an upper narrow side of the reinforcing ribs bears against an inner wall of the hollow valve cone at least in sections.

Blanchet discloses a valve for internal combustion engines. In Figure 5, Blanchet teaches where an upper narrow side "e" forms a reinforcing rib of a gripping receiver for a stem "a".

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate, in Heinz in view of Kirby taken with Cummings, an upper narrow side of the reinforcing rib, as taught by but Blanchet, so as to increase the surface area of the reinforcing rib

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that connects to the stem. The proposed combination necessarily teaches where the upper narrow side of the reinforcing ribs complements and supports the inner wall of the hollow valve cone.

Allowable Subject Matter

7. Claim 36 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments with respect to Claims 16, 18, 22, 31-34, and 37-39 have been considered but are moot in view of the new ground(s) of rejection. Claims 16, 18, 22, 31-34, and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinz (DE19731382) in view of Kirby (4,744,340). Claims 21, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinz in view of Kirby as applied to Claims 16 and 22 above, taken with Topham et al. (5,044,604). Here, Topham is used merely to detail the shape of reinforcing ribs as being rectilinear strips as per the rejections above. Claims 25, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heinz in view of Kirby as applied to Claims 16 and 22 above, taken with Cummings (2,439,240). Here, Cummings is used merely to show the known connection between the reinforcing ribs and hollow valve cone.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy S. Baskin whose telephone number is (571) 270-7421. The examiner can normally be reached on Monday through Friday, 7:30AM to 5:00PM ET.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John Rivell/
Primary Examiner, Art Unit 3753

/J. S. B./
Examiner, Art Unit 3753